**Module Descriptor**

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| **Title** | Data Analysis and Visualisation | | |
| **Session** | 2025/26 | **Status** | Published |
| **Code** | COMP11108 | **SCQF Level** | 11 |
| **Credit Points** | 20 | **ECTS (European Credit Transfer Scheme)** | 10 |
| **School** | **Computing, Engineering and Physical Sciences** | | |
| **Module Co-ordinator** | Shahid Mahmood Awan | | |

**Summary of Module**

This module examines the factors that have led to the emergence and increasing popularity of data analytics (also known as business intelligence or business analytics) and how this business function supports corporate decision makers. This module examines the technologies necessary to provide data analytics such as the backend databases and frontend tools. This module reviews the main methodologies for designing the backend databases (known as data warehouses), and also considers more affordable options for smaller businesses. This module examines the additional technologies that can form the data analytics environment including tools capable of providing online analytical processing (OLAP), data mining and dashboards. This module considers the major vendors in the data analytics environment such as SAS, SAP, Microsoft, Oracle and open-source providers such as BIRT. This module explores emerging trends associated with the data analytics such as in-memory analytics, self-service BI (SSBI), data as a service (DaaS) and sentiment analysis.

This module includes practical classes using a data analytics tool such as Tableau to learn about the process of Visual Data Discovery (VDD). Data visualisations are key in supporting the data analytics process and this module will highlight best practices in their creation. Students will be exposed to data analytics scenarios that requires investigation of emerging data analytics technologies and exploration of data sets using VDD.

The intended audience for this module are students interested in following a career in data management and/or data analytics.

This module will work to develop a number of the key 'I am UWS' Graduate Attributes to make those who complete this module: Universal (Critical Thinker, Ethically-minded, Research-minded), Work Ready (Problem-Solver, Effective Communicator, Ambitious) and Successful (Autonomous, Resilient, Driven)

| Module Delivery Method | On-Campus[1] ☒ | Hybrid[2] ☐ | Online[3] ☐ | Work -Based Learning[4] ☐ |
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| **Campuses for Module Delivery** | ☐ Ayr<br>☐ Dumfries | ☐ Lanarkshire<br>☒ London<br>☒ Paisley | ☐ Online / Distance Learning<br>☐ Other (specify) | |

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| **Terms for Module Delivery** | Term 1 | ☒ | Term 2 | ☒ | Term 3 | ☒ |
| **Long-thin Delivery over more than one Term** | Term 1 – Term 2 | ☐ | Term 2 – Term 3 | ☐ | Term 3 – Term 1 | ☐ |

| **Learning Outcomes** | |
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| **L1** | Demonstrate a critical understanding of the principal theories, concepts and issues associated with data analytics and data visualisation. |
| **L2** | Demonstrate knowledge and a critical understanding of the principal methodologies, techniques and technologies associated with data analytics and visualisation |
| **L3** | Use a range of routine and specialist skills, techniques and technologies to conduct data analysis including data visualisations for a given case study |
| **L4** | N/A |
| **L5** | N/A |

| **Employability Skills and Personal Development Planning (PDP) Skills** | |
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| **SCQF Headings** | **During completion of this module, there will be an opportunity to achieve core skills in:** |
| **Knowledge and Understanding (K and U)** | **SCQF 11**<br>A critical understanding of the principal theories, concepts and principles associated with data analytics and data visualisation. A critical understanding of the principal theories, concepts and services associated with data analytics and data visualisation technologies. Extensive, detailed and critical knowledge and understanding of best practices and approaches to data analytics and data visualisation |
| **Practice: Applied Knowledge and Understanding** | **SCQF 11**<br>Use a range of the principal professional skills, techniques, practices and/or materials associated with the analysis and visualization of data |

[1] Where contact hours are synchronous/ live and take place fully on campus. Campus-based learning is focused on providing an interactive learning experience supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus contact hours will be clearly articulated to students.

[2] The module includes a combination of synchronous/ live on-campus and online learning events. These will be supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus and online contact hours will be clearly articulated to students.

[3] Where all learning is solely delivered by web-based or internet-based technologies and the participants can engage in all learning activities through these means. All required contact hours will be clearly articulated to students.

[4] Learning activities where the main location for the learning experience is in the workplace. All required contact hours, whether online or on campus, will be clearly articulated to students

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| **Generic Cognitive skills** | **SCQF 11**<br>Apply critical analysis, evaluation and synthesis to forefront issues and routine problems (including those associated with the security and privacy of data) associated with the development and use of data analytics and visualization applications in a business environment |
| **Communication, ICT and Numeracy Skills** | **SCQF 11**<br>Critically analyse, interpret, and evaluate case study data and visualisations to achieve business goals and targets |
| **Autonomy, Accountability and Working with Others** | **SCQF 11**<br>Take responsibility for own work and/or significant responsibility for the work of others and for a range of resources in undertaking the necessary activities to complete the module coursework |

| **Prerequisites** | **Module Code** | **Module Title** |
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| | **Other** | |
| **Co-requisites** | **Module Code** | **Module Title** |

| **Learning and Teaching** | |
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| In line with current learning and teaching principles, a 20-credit module includes 200 learning hours, normally including a minimum of 36 contact hours and maximum of 48 contact hours.<br>This module is delivered through live and pre-recorded lectures. Lectures are supplemented with tutorials for smaller groups of students to allow for the re-examination of the more complex aspects of the syllabus. Lab (PC)-based classes complement the lectures by providing an environment to support the learning of the more practical-based aspects of the syllabus. | |
| **Learning Activities**<br>During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below: | **Student Learning Hours**<br>(Note: Learning hours include both contact hours and hours spent on other learning activities) |
| Lecture / Core Content Delivery | 20 |
| Tutorial / Synchronous Support Activity | 8 |
| Laboratory / Practical Demonstration / Workshop | 20 |
| Independent Study | 152 |
| Please select | |
| Please select | |
| **TOTAL** | 200 |

| **Indicative Resources** |
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| **The following materials form essential underpinning for the module content and ultimately for the learning outcomes:**<br>Successful Business Intelligence: Unlock the Value of BI & Big Data, 2nd Edition by Cindi Howson (2014) McGraw-Hill Osborne* |

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| **(N.B. Although reading lists should include current publications, students are advised (particularly for material marked with an asterisk*) to wait until the start of session for confirmation of the most up-to-date material)** |

| **Attendance and Engagement Requirements** |
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| **In line with the Student Attendance and Engagement Procedure, Students are academically engaged if they are regularly attending and participating in timetabled on-campus and online teaching sessions, asynchronous online learning activities, course-related learning resources, and complete assessments and submit these on time.**<br><br>**For the purposes of this module, academic engagement equates to the following:**<br><br>The School of Computing, Engineering and Physical Sciences considers attendance and engagement to mean a commitment to attending, and engaging in, timetabled sessions. You will scan your attendance via the scanners each time you are on-campus and you will login to the VLE several times per week. Where you are unable to attend a timetabled learning session due to illness or other circumstance, you should notify the Programme Leader that you cannot attend. Across the School an 80% attendance threshold is set. If you fall below this, you will be referred to the Student Success Team to see how we can best support your studies. |

| **Equality and Diversity** |
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| **The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: UWS Equality, Diversity and Human Rights Code.**<br><br>Aligned with the University's commitment to equality and diversity, this module supports equality of opportunity for students from all backgrounds and learning needs. Using the VLE, material will be presented electronically in formats that allow flexible access and manipulation of content. This module complies with University regulations and guidance on inclusive learning and teaching practice. This module has lab-based teaching and as such you are advised to speak to the Module Co-ordinator to ensure that specialist assistive equipment, support provision and adjustment to assessment practice can be put in place, in accordance with the University's policies and regulations. |
| **(N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School)** |

**Supplemental Information**

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| **Divisional Programme Board** | **Computing** |
| **Overall Assessment Results** | ☐ **Pass / Fail** ☒ **Graded** |
| **Module Eligible for Compensation** | ☐ **Yes** ☒ **No**<br><br>**If this module is eligible for compensation, there may be cases where compensation is not permitted due to programme accreditation requirements. Please check the associated programme specification for details.** |
| **School Assessment Board** | Business & Applied Computing |
| **Moderator** | Raja Ujjan |
| **External Examiner** | A Malhi |
| **Accreditation Details** | |
| **Module Appears in CPD catalogue** | ☐ **Yes** ☒ **No** |

| Changes / Version Number | 1.1 |
|---|---|

| Assessment (also refer to Assessment Outcomes Grids below) |
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| **Assessment 1** |
| Formative assessment is available using on-line practice tests (on Aula) - that allow students to test their progress and understanding of the syllabus. The first summative component of assessment is a class test worth 10% (individual) and this takes place approximately halfway through the module and the third summative component of assessment is towards the end of the module and this class test is worth 40% (individual). The results for these two summative assessments are combined to give a total worth 50%. |
| **Assessment 2** |
| Formative assessment is available through completion of the practical labs - that allow students to test their progress and understanding of the practical aspects of the syllabus. The second summative assessment is lab- based, group work coursework worth 50% which is undertaken in the second half of the module. |
| **Assessment 3** |
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| (N.B. (i) Assessment Outcomes Grids for the module (one for each component) can be found below which clearly demonstrate how the learning outcomes of the module will be assessed.<br>(ii) An indicative schedule listing approximate times within the academic calendar when assessment is likely to feature will be provided within the Student Module Handbook.) |

| Component 1 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Assessment Type** | **LO1** | **LO2** | **LO3** | **LO4** | **LO5** | **Weighting of Assessment Element (%)** | **Timetabled Contact Hours** |
| Class test (written) | ☒ | ☒ | ☐ | ☐ | ☐ | 50 | 0 |

| Component 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Assessment Type** | **LO1** | **LO2** | **LO3** | **LO4** | **LO5** | **Weighting of Assessment Element (%)** | **Timetabled Contact Hours** |
| Dissertation/ Project report/ Thesis | ☒ | ☒ | ☒ | ☐ | ☐ | 50 | 0 |

| Component 3 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Assessment Type** | **LO1** | **LO2** | **LO3** | **LO4** | **LO5** | **Weighting of Assessment Element (%)** | **Timetabled Contact Hours** |
| | ☐ | ☐ | ☐ | ☐ | ☐ | | |
| **Combined total for all components** | | | | | | 100% | 0 hours |

**Change Control**

| What | When | Who |
|---|---|---|
| Attendance Update, EDI Update and External Examiner update | 21/01/2025 | A Adamson |
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